CLAIMS

1. A transimpedance amplifier, comprising:

a substrate;

an amplifier circuit formed on said substrate;

a photodetector pad for connection to an external photodetector; and

an auxiliary photodetector formed on said substrate adjacent to said amplifier circuit.

2. The transimpedance amplifier of claim 1, where said auxiliary photodetector does not significantly affect high speed performance of said transimpedance amplifier.

3. The transimpedance amplifier of claim 1, wherein said substrate comprises at least one of silicon, silicon-on-insulator, gallium arsenide, indium gallium arsenide, and indium phosphide.

4. The transimpedance amplifier of claim 1, wherein said amplifier circuit comprises at least one of metal oxide semiconductor, metal semiconductor, bipolar junction transistor, and heterojunction bipolar transistor.

5. The transimpedance amplifier of claim 1, wherein said auxiliary photodetector comprises one of a P-N photodiode, a P-I-N photodiode, a metal-semiconductor-metal photodetector and an avalanche photodetector.

6. The transimpedance amplifier of claim 1, wherein said auxiliary photodetector comprises a structure similar to that of a standard electro-static discharge diode.

7. The transimpedance amplifier of claim 1, wherein said auxiliary photodetector is provided at an input of the transimpedance amplifier in parallel with attachment points to the external photodetector.

8. The transimpedance amplifier of claim 1, wherein said auxiliary photodetector is provided to facilitate contact-less probing at input points of the transimpedance amplifier to test the transimpedance amplifier at wafer level.

9. The transimpedance amplifier of claim 1, wherein said auxiliary photodetector is optically excited to test the transimpedance amplifier at wafer level.

10. The transimpedance amplifier of claim 9, wherein said auxiliary photodetector is excited using short wavelength light.

11. The transimpedance amplifier of claim 9, wherein said auxiliary photodetector is excited by illumination, and the transimpedance amplifier is tested by detecting an output of the transimpedance amplifier.

12. The transimpedance amplifier of claim 11, where said output is detected by probing a supply voltage and detecting switching currents passing through a bias tee using a spectrum analyzer.

13. The transimpedance amplifier of claim 11, where said output is detected using a high gain antenna and a sensitive narrow band receiver.

14. The transimpedance amplifier of claim 11, where said output is detected using a high speed electrical probe by either direct contact or capacitive proximity coupling.

15. A method of testing a transimpedance amplifier at wafer-level, comprising the steps of:

inserting a transimpedance amplifier, the transimpedance amplifier comprising a substrate, an amplifier circuit formed on said substrate, a photodetector pad for connection to an external photodetector, and an auxiliary photodetector formed on said substrate adjacent to said amplifier circuit;

probing power and ground connections of said transimpedance amplifier;

illuminating said auxiliary photodetector with modulated laser light deflected by optical beam splitters; and

detecting output of the transimpedance amplifier.

16. The method according to claim 15, wherein said output is detected using a high speed electrical probe by either direct contact or capacitive proximity coupling.

17. The method according to claim 15, wherein said output is detected using a directional high gain antenna and a sensitive narrow band receiver.

18. The method according to claim 15, wherein said output is detected by probing a supply voltage of the transimpedance amplifier and detecting switching currents passing through a bias tee using a spectrum analyzer.

19. The method according to claim 15, wherein said transimpedance amplifier comprises an array of transimpedance amplifiers.

20. The method according to claim 19, wherein said illuminating said auxiliary photodetector further comprises selectively illuminating individual auxiliary photodetectors with modulated laser light deflected by said optical beam splitters.

21. The method according to claim 20, wherein said laser light is steered to selectively illuminate said auxiliary photodetectors without moving said power and ground connections of said transimpedance amplifiers.

22. The method according to claim 20, further comprising applying beams having different frequencies while being within a passband of the transimpedance amplifier.

23. A testing system for testing a transimpedance amplifier at wafer-level, the transimpedance amplifier comprises a substrate, an amplifier circuit formed on said substrate, a photodetector pad for connection to an external photodetector, and an auxiliary photodetector formed on said substrate adjacent to said amplifier circuit, the testing system comprising:

at least one probe for probing power and ground connections of said transimpedance amplifier;

an illumination system comprising optical beam splitters for illuminating said auxiliary photodetector with modulated laser light deflected by said optical beam splitters; and

a detection device for detecting output of the transimpedance amplifier.

24. The system according to claim 23, wherein said detection device comprises a high speed electrical probe by either direct contact or capacitive proximity coupling.

25. The system according to claim 23, wherein said detection device comprises a directional high gain antenna and a sensitive narrow band receiver.

26. The system according to claim 23, wherein said detection device comprises a bias tee, and said output is detected by probing a supply voltage of the transimpedance amplifier and detecting switching currents passing through a bias tee using a spectrum analyzer.

27. The system according to claim 23, wherein said transimpedance amplifier comprises an array of transimpedance amplifiers.

28. The system according to claim 27, wherein the modulated laser light deflected by said optical beam splitters selectively illuminate individual auxiliary photodetectors.

29. The system according to claim 28, wherein said laser light is steered to selectively illuminate said auxiliary photodetectors without moving said optical beam splitters or said probe.

30. The system according to claim 28, wherein said laser light comprises beams having different frequencies while being within a passband of the transimpedance amplifier.